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The flip side of digital technologies in internal party elections: a cybersecurity dilemma?

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The digitalization of party organizations has garnered increasing scholarly attention in recent years. This study examines an underexplored area: how individuals working for political parties perceive the cybersecurity threats associated with using digital technologies for intra-party voting procedures. Drawing on survey data collected online in 2021 from three European democracies (Belgium, Italy, and Spain), our analysis reveals that cybersecurity concerns are more pronounced among party actors who (1) are non-elected staffers born before the 1980s, (2) had negative experiences with digital technologies during the COVID-19 crisis, or (3) work for right-wing parties. Our findings highlight the need to avoid technological determinism and call for a more systematic study of cybersecurity challenges in the context of party digitalization.

Keywords: Political parties; technological attitudes; cybersecurity; intra-party democracy; digitalization

Introduction

While the COVID crisis rekindled the debate around online voting (Cipullo and Moglie 2021) and emphasized the digital resilience of democratic practices (Elstub 2021), using digital tools to conduct elections and decision-making procedures remains a potential source of uneasiness for both representatives and voters. Negative opinions about the digitalization of democracy often stem from technological and normative concerns regarding the need to protect the integrity of the electoral process. Existing research has primarily examined whether digital technologies provide a secure interface for conducting democratic processes, focusing on cybersecurity issues related to digitalized elections (e-voting) (Bruter 2023; Garnett and James 2020; Park 2021; Schryen 2004). Fears are generally rooted in the potential for fraud, manipulation, misappropriation, and interference in the outcomes (Garnett and James 2020; von Nostitz and Sandri 2021). These risks include external threats, such as foreign meddling via hackers, and internal threats

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from actors who might gain access to the electronic voting system. Moreover, the secret aspect of voting could be compromised in the event of large-scale cyberattacks or data breaches.

In this paper, we argue that these sources of concern can also be applied to democratic processes occurring within political parties. Security issues may also arise when parties rely on digital technologies to perform core tasks in their internal operations, particularly regarding the integrity and safety of internal election mechanisms (i.e. intra-party democracy). Highlighting these challenges is crucial because, as part of a broader process of digitalizing their organizational pillars (Fitzpatrick 2021), political parties have increasingly used digital technologies to conduct internal elections. A few studies have examined the digitalization of procedures for (s)electing party leaders and candidates (Bloquet, Borucki, and Höhne 2022; Kenig and Pruysers 2018), a key moment of party life. However, since the mid-2010s, an increasing number of parties have also relied on digital voting techniques to consult their grassroots on other significant decisions, such as forming electoral alliances, expressing confidence in government, shaping the party manifesto, or intra-party reform (Barberà et al. 2021; Gerbaudo 2019; Legein 2023; Lupato and Meloni 2023; Piquer and Jäger 2020; Sandri 2024). Moreover, the COVID-19 crisis has accelerated the adoption of digital technologies within parties (Paulis and Kins 2022).

This article explores the opinions of party actors (i.e. elected representatives and their assistants) regarding the security issues that may arise from using online technologies for voting procedures within parties. To achieve this, we first develop a theoretical framework to better capture the individual and party-level factors that may shape attitudes toward the security of digital intra-party voting (DIPV). Second, we describe how online survey data were collected in Belgium, Spain, and Italy to create an original dataset comprising 238 individual actors active in over 50 political parties. Then, we analyze how various sociodemographic, ideological, and organizational factors influence concerns about the security of DIPV. Finally, we discuss the implications of our findings for future research on the digitalization of party organizations and beyond.

Theoretical framework

Only a few pioneering studies have examined the opinions of party actors on digital technologies (Bloquet, Borucki, and Höhne 2022; Dommett 2020). Yet, these attitudes may play a crucial role in collective decisions increasingly made to digitalize (or not) certain activities or mechanisms within party organizations. Research in other organizational settings has already revealed a significant relationship between staff attitudes toward technology and the capacity of an organization to adapt to new digital tools, especially in a post-pandemic context (Barrutia and Echebarria 2021; Rauseo 2023). As Mergel and colleagues (2019, 11) note, 'a change in culture, skills, and mindset has been identified as an important condition to make digital transformation last'. This suggests that individuals who trust digital technologies are a key factor in enabling a successful or smoother digital transition. In contrast, technological distrust likely hinders progress toward digitalization or limits its scope.

Our study investigates the concerns that party actors may have regarding the security of DIPV. After all, whether elected or not, political staffers are also individual citizens, and potential 'digital doubters' who worry about privacy and surveillance issues associated with digital technologies (Kostka 2023). Yet, in the context of party organizations, these cybersecurity concerns may have broader and more significant collective

implications. Bloquet, Borucki, and Höhne (2022) examined attitudes toward the digitalization of candidate selection, highlighting sociological drivers of support and resistance. However, their study focused solely on the views of party members (not staffers or politicians), and did not incorporate perceived security threats. Other contributions have addressed the increasing use of digital voting in intra-party democracy, focusing primarily on the inclusive/exclusive or centralized/decentralized nature of party decision-making (De Blasio and Viviani 2020; de Nadal 2021; Gerbaudo 2021; Ignazi 2020). However, they have left unanswered the question of how individual party actors perceive the cybersecurity challenges inherent to its implementation.

Our framework relies on two main dimensions to explain variations in how party actors perceive safe and secure DIPV procedures. On the one hand, the relationship and experience that each party actor develops with digital technologies at the individual level is expected to shape their perception of security issues. On the other hand, at the party level, each party has its own organizational structure, features, and history with digital tools (Barberà et al. 2021), which may also influence the risks perceived by individuals working within them.

Individual-level factors

The digitalization of intra-party voting mechanisms is often assumed to create new channels of participation within parties (Faucher 2014). While expanding participatory mechanisms may strengthen intra-party democracy and legitimacy (Ignazi 2020), it is important to note that political participation is profoundly shaped by individual and social factors (Armingeon and Schädel 2015; Dalton 2017; Verba, Schlozman, and Brady 1995), even in digital contexts (Lybeck, Koiranen, and Koivula 2023; Vicente and Suenaga 2020). Significant inequalities exist in citizens' levels of online and offline political engagement, depending on socio-demographic profiles and available resources. Moreover, the literature on the digital divide has extensively explored whether and how access to and use of the Internet and digital technologies have contributed to bridging or deepening structural imbalances (Büchi, Just, and Latzer 2016; Lythreatis, Singh, and El-Kassar 2022). Based on this extensive body of research, our first intuitive assumption is that party actors' socio-demographic profiles could influence their concerns about the security of DIPV, as individual-level characteristics such as age, gender, and education are correlated with attitudes and behaviors toward digital tools more generally. In addition, research in organizational sociology and computer science has specifically examined individuals' attitudes toward cybersecurity threats and their links to risky online behaviors, often finding that individual characteristics play a significant role.

First, some studies suggest that the relationship with technology may be influenced by gender (Lohan and Faulkner 2004). While there are no substantial differences in ICT access in Western contexts, scholars have identified significant disparities in attitudes and usage patterns. Globally, men tend to have more positive attitudes toward digital technologies than women (Lee 2019). These differences are often attributed to factors such as gender role beliefs, lower self-efficacy, lower computer self-efficacy, and higher levels of computer anxiety among women (Hargittai and Shaw 2015; Sobieraj and Krämer 2020; Van Deursen and Van Dijk 2015). Additionally, institutional reports suggest that women are more frequently subjected to cyber harassment and violence. For example, the Inter-Parliamentary Union (2016) reported that more than 80% of female parliamentarians experienced some form of psychological violence, primarily through social media,

while in office. This situation may make women more concerned about privacy and security issues related to digital technologies.

Second, although the age-based digital divide is narrowing, older adults generally report less comfort and confidence in using computers compared to younger people (Lee 2019). Scholars have also noted generational differences in the perception of cybersecurity threats (Tabata, Sato, and Ninomiya 2021), vulnerability (Morrison 2023), and the ability to cope with these challenges, with older individuals often being at a disadvantage (Huang, Rau, and Salvendy 2010). Privacy and security issues are particularly salient for older adults and are among the key factors preventing them from adopting digital technologies (Knight, Yuan, and Bennett Gayle 2024). Third, studies have shown that individuals with lower levels of education are more likely to fall victim to cybersecurity threats due to lower levels of knowledge and efficacy (Dodel and Mesch 2018). In contrast, those with higher education levels are often better equipped to navigate the digitalized world. With greater internet security awareness (An et al. 2023), they tend to be less concerned about security and privacy issues and exhibit more confidence in using digital technologies.

Based on this literature, we expect that party actors' attitudes toward the cybersecurity threats of DIPV will be influenced by their socio-demographic characteristics (gender, age, and level of education). Our first expectation is that party actors with social attributes typically associated with negative views on internet-based security and privacy challenges will express greater concerns about similar issues in the context of using digital tools for voting within their party. Consequently, we first hypothesize that:

> H_1: Party actors with social attributes linked to negative attitudes toward internet-based security and privacy issues (i.e. female, older, and/or lower formal education) are more likely to express concerns about the security of DIPV procedures.

Second, based on their role within the party organization, individuals' perceptions of cybersecurity issues may also vary. Changing the way decisions are made within political parties not only presents technical challenges but also has broader organizational implications. For example, digitalizing decision-making procedures could expand the internal electorate (Scarrow, Webb, and Poguntke 2022). Empirical evidence already shows that elected officials are generally more opposed to the digitalization of intra-party procedures than regular members, as it could alter the power dynamics within the party by empowering the grassroots at their expense (Bloquet, Borucki, and Höhne 2022; Gherghina and Marian 2024; Ignazi 2020). The general assumption is that elected officials have incentives to preserve the internal status quo, which has often helped them secure their position within the party. Therefore, it may not be surprising if they express more cybersecurity concerns, as these concerns could support the narrative that internal party voting mechanisms should not be digitalized. In contrast, non-elected staffers and assistants may be less concerned about the security of these digital intra-party mechanisms since they are less directly impacted by the digitalization of intra-party voting. In addition, MPs are usually older than assistants (Brandsma and Otjes 2024), and this generational gap may translate into attitudes towards cybersecurity, with elected officials being more skeptical about security and privacy issues and concerned about the potential negative implications when these tools are used for internal party democracy. Hence, our second hypothesis holds that:

H$_2$: Members of parliament (MPs) are more likely to express concerns about the security of DIPV procedures than parliamentary assistants (PAs).

Third, we also expect individuals' experiences with the COVID-19 crisis to correlate with general perceptions of risks related to DIPV. First, this period crystallized debates and reflections on security threats and privacy issues related to the use of digital technologies, both in the field of health and more generally. The pandemic marked an increase in concerns about the use of personal data and surveillance, alongside the emergence of new tracking technologies (Bore 2021; Budd 2020; Celeste, Montgomery, and Suriyawongkul 2022). Second, research in non-political organizations has shown that staff attitudes toward certain technological innovations were directly linked to the quality of their online professional activities during the lockdowns (Barrutia and Echebarria 2021; Russo and Chironi 2023). In short, those who negatively evaluated the almost complete digitalization of their activities during the peak of the crisis expressed more apprehensive attitudes toward digital technologies afterward. Although management and organizational research generally describe this forced digitalization as a socio-technological advance with many organizational and social benefits, some scholars have also warned about its 'dark side' (Trittin-Ulbrich 2021), and the importance of addressing the cybersecurity challenges that came with it (Saeed 2023). Considering these findings, we expect that party actors who negatively evaluated online party activities and digital party infrastructure during the pandemic will likely raise more concerns about the cybersecurity of DIPV, as the crisis may have activated (or reinforced) negative views on the risks of using digital technologies for intra-party purposes. From this, the third hypothesis posits that:

H$_3$: Party actors who have negatively experienced the digitalization of party activities and infrastructures during the COVID-19 crisis are more likely to express concerns about the security of DIPV procedures compared to those who report a positive assessment.

Party-level factors

Our next set of hypotheses focuses on organizational characteristics. The main divide that structures the debate around the digitalization of political parties generally transcends the usual left-right ideological spectrum and contrasts the experiences of radical (right and left) parties with those of mainstream organizations that support moderate ideologies (Barberà et al. 2021; Lioy, Del Valle, and Gottlieb 2019; Raniolo, Tarditi, and Vittori 2021; Vittori 2024). Previous research has shown that political parties at both ends of the political spectrum have stood out in the past decade due to their substantial use of digital technologies, not only for communication purposes but also to enhance intra-party participation, including through online collaborative platforms (Caiani and Parenti 2013; Deseriis and Vittori 2019; Gerbaudo 2019). In contrast, mainstream, moderate parties – anchored in traditional ideologies such as liberalism, social democracy, and conservatism, which have historically structured politics in European societies – are often cited as lagging when it comes to digitalizing their organizations and activities (Raniolo, Tarditi, and Vittori 2021).

Therefore, we expect individuals in parties that promote radical (left or right) ideologies to be, on average, less concerned about security issues related to DIPV. While not denying that they might be aware of these challenges, they should be less likely to view them as a threat to the functioning of their internal organization and, as a result, should report fewer concerns. Digital technologies are essential for radical parties, and the perceived benefits should ultimately outweigh the risks. In contrast, individuals in ideologically moderate

parties are expected to report a higher level of cybersecurity concerns, reflecting a more cautious approach to the use of digital tools. We posit that in such parties, security risks are likely to be perceived as more significant than the potential benefits:

> H_4: Actors in moderate parties are more likely to express concerns about the security of DIPV procedures than their counterparts in radical parties.

Besides this line of division, the gap may also be considered generational (Lupato and Meloni 2023). Internal resistance to redesigning key organizational components – such as decision-making mechanisms, or more generally any innovation that can challenge the status quo – is more common within political parties with consolidated and institutionalized structures, which are highly subject to path-dependency and inertia (Lioy, Del Valle, and Gottlieb 2019). In contrast, 'newer' parties that have emerged more recently would benefit from the presence of digital tools since their inception. For these parties, digitalization does not represent a fundamental disruptive organizational upheaval because it is constitutive of their emergence, development, and sometimes success (Correa 2021). Moreover, they are also more likely to rely on younger, more dynamic, and tech-savvy personnel (Spierings and Jacobs 2019), who are more capable of coping with the rapidly changing technological landscape. We thus expect that individuals active in younger parties will generally be less concerned about security issues related to DIPV. As these younger parties have usually emerged and grown in parallel with the development of digital tools, they should have prioritized acquiring the knowledge and resources to make their use safe and secure, implying that their staff should trust them more and report fewer concerns. In contrast, individuals working in more institutionalized parties, with older structures may report higher levels of concern regarding the security of DIPV. The digitalization of decision-making procedures, which may have been routinized for a long time, may generate fears and concerns about the integrity of the internal electoral process and, more broadly, of intra-party democracy. This leads us to hypothesize that:

> H_5: Actors in younger parties are more likely to express concerns about the security of DIPV procedures than their counterparts in older parties.

Finally, despite the left-right dimension being often put aside when it comes to parties' digitalization, we believe it is still worth testing it regarding the cybersecurity concerns of DIPV. Some studies suggest that left-wing parties place more value on participation and internal democracy compared to right-wing parties, which emphasize hierarchical control (Kostelka and Rovny 2019; Oross and Tap 2023; Raniolo and Tarditi 2020). At the same time, public opinion research shows that attitudes toward cybersecurity are generally linked to left-right identification. Left-leaning, liberal citizens tend to give less importance to cybersecurity threats and risks than right-leaning, conservative ones, who are more likely to be concerned about them (Nam 2019). Therefore, we expect that individuals working in left-leaning parties will be less concerned about security issues related to DIPV, as they are likely to prioritize the expansion of intra-party democracy through digitalization and be less fearful of the associated risks. In contrast, those working in right-wing parties are expected to place more emphasis on security issues, which may also reflect some reluctance toward developing more (digital) intra-party democracy. Hence, our last hypothesis holds that:

H$_6$: Actors in right-leaning parties are more likely to express concerns about the security of DIPV procedures than their counterparts in left-leaning parties.

Data and method

Case selection

Our study is exploratory and represents a first attempt to empirically examine the cybersecurity concerns underlying the digitalization process of party organizations. Specifically, we investigate the attitudes of party actors toward the security of DIPV procedures. We conducted this by surveying individual actors working in different political parties active in three European democracies: Belgium, Italy, and Spain. Although our analysis primarily focuses on individual and party-level factors, the selection of these three countries is mainly driven by the willingness to compare parties and individuals evolving in similar context.

First, the three countries share multi-level, fragmented party systems, that necessitate coalition governance. In Belgium, the political landscape is primarily divided along linguistic lines, with Dutch-speaking and French-speaking communities (Dandoy and Jeroen 2018). Spain contends with strong regionalist and nationalist movements, including Catalan and Basque parties (Gillespie 2015). Italy has experienced the proliferation of new parties and movements, also at the regional level, resulting in frequently shifting coalitions (Zucchini and Pedrazzani 2021). More broadly, in all three countries, the dominant position of traditional mass parties (on both the left and right) has been electorally challenged in recent years by competitors promoting radical ideologies (left or right) and leveraging digital media for communication and organization. Notable examples include radical parties such as Vox and Podemos in Spain (Vampa 2020), Fratelli d'Italia in Italy (Giannetti, Umansky, and Sened 2024), and Vlaams Belang or the Parti du Travail de Belgique in Belgium (Kins, Jacobs, and Close 2024).

Second, the three countries experienced similar containment policies, resulting in all parties facing comparable restrictions in organizing day-to-day activities during the COVID-19 pandemic (Bouhon 2020; Rodríguez Teruel, Del Pino, and Real-Dato 2023). This means that parties and individuals were subject to a similar context of forced digitalization when data was collected, necessitating the extensive integration of digital tools not only for communication but also to handle internal tasks and maintain party functionality (Paulis and Kins 2022). This context is important because, before the COVID crisis, Italy and Spain were often depicted as particular, emblematic cases – the cradles of 'digital parties', which have attracted considerable scholarly attention for their use of digital tools to enhance intra-party democracy (Gerbaudo 2021). In Italy, the Five Star Movement (M5S) emerged as a digital-first populist party, using platforms like Rousseau to engage members in decision-making. In Spain, from its birth, Podemos utilized online tools to organize grassroots support and internal democracy. These parties have then become fixtures in their respective party systems and even participated in coalition governments (Cervera-Marzal 2020; Giannetti, Umansky, and Sened 2024). In contrast, Belgium is less typical because no prominent digital party can be identified. While the far-right has long been a pioneer in using digital tools, particularly for communication purposes, other Belgian parties have lagged behind (Paulis 2021; Sijstermans 2021). Despite the far-right maintaining its lead, most Belgian parties have now bridged the digital gap – like in Italy and Spain (Raniolo and Tarditi 2020; Sandri 2024; Sánchez Medero 2024), to the extent that some rank among the largest spenders

on digital campaign expenditures in Europe (Vanden Eynde 2023). Moreover, because of digital experiments during the COVID crisis, Belgian party organizations – like their counterparts in Italy and Spain (Sandri 2024) – have increasingly integrated digital tools, whether for managing or interacting with members and supporters. For instance, the major French-speaking right-wing party *Mouvement Réformateur* now fully organizes party presidential elections online, with the modality and rules being enshrined in party statuses.[1] Additionally, existing research shows that digital parties in Spain and Italy may have taken steps back regarding digital procedures (Meloni and Lupato 2022), which implies that they are less distinctive in this respect than they were in the past. In other words, political parties would have become increasingly similar when it comes to the adoption of digital tools, stressing a process of institutional isomoformism (González-Cacheda and Cancela Outeda 2024).

Third and final, in the three countries, the period preceding the COVID-19 crisis – and the years since – has seen a sharp increase in cybersecurity concerns across the media, the general population, and political elites. These countries have faced various issues related to disinformation, hacking, and Russian bots, particularly during the 2018 (Italy) and 2019 (Spain and Belgium) election campaigns. The prominence of this debate was heightened during the digital shift prompted by the health pandemic and remains a central issue, frequently resurfacing in recent elections. According to specific Eurobarometer studies, concerns about cybersecurity and its potential to undermine democracy particularly increased between 2017 and 2020 in Europe, including in these three countries (European Commission 2020).

As a result, we believe that the three countries offer a relatively common background for studying individual party actors' attitudes toward the cybersecurity dilemma inherent to party digitalization. They also enable meaningful comparisons across a wide range of parties in terms of organizational structures, ideologies, and digitalization strategies.

Data

Our hypotheses are tested using an original dataset collected in 2021 through an online standardized survey. The survey's primary goal was to gather information from party actors about their experiences with the transfer of most party activities online following the COVID-19 pandemic. It was launched shortly after containment measures were lifted in all three countries. The survey was conducted using LimeSurvey in Italy and Spain, and Qualtrics in Belgium. In total, the questionnaire comprised 34 questions divided into five sections: (1) the frequency of online meetings for different party organs before and during the pandemic, (2) the organization of intra-party activities, (3) the use of digital voting techniques, (4) the relevance of potential problems associated with online activity, and (5) the prospective use of digital tools to replace various activities. Participants were also asked to provide personal information, including their party affiliation. This enables us to incorporate data on the characteristics of their parties.

The survey invitation was addressed to personnel (elected officials and non-elected staffers/assistants) working in the public offices of all parties represented in either national or regional parliaments in the three countries.[2] We targeted this group because they are frequently exposed to the internal use of digital tools but remain under-studied regarding their attitudes toward digitalization. Furthermore, these actors can be publicly identified and contacted, allowing them to personally handle requests to participate in the survey. Gaining access to party members in central offices or grassroots positions would have required direct coordination with party headquarters. Our population of interest therefore

comprises elected representatives in national or regional parliaments, their staffers, and those working for parliamentary party groups.[3] The population was estimated to include approximately 1,500 individuals in Italy and Spain (Vittori and Barberà 2023), and around 1,000 in Belgium.[4] In each country, the public email addresses of MPs and their staffers were collected and used to contact potential respondents. MPs were also encouraged to share the invitation with their staff. In total, approximately 260 email addresses were gathered and targeted in Spain, 800 in Italy, and 600 in Belgium. While the survey was unilingual in Italy, respondents in Spain could access it in Catalan or Spanish, and those in Belgium could respond in French or Dutch.

Our resulting database includes 238 individuals from 48 political parties (see Appendix 1 for the full list), for whom we gathered enough reliable information to proceed with the analyses. Unfortunately, this corresponds to a very low response rate. We estimate that this final sample represents only 6% of the total population that could have been theoretically reached. This constitutes a significant shortcoming of our study, although not entirely surprising. It highlights the considerable difficulty in mobilizing party actors for online surveys, as previously noted by Vis and Stolwijk (2021). It remains thus unclear to what extent participants differ from non-participants. Additionally, there are notable biases in our sample. First, Spanish respondents are over-represented (43.7%) compared to Belgians (29.4%) and Italians (26.9%). This over-representation can be attributed to the presence of numerous small regionalist parties in Spain, which were relatively more responsive to the survey. Second, personnel from (radical) left-wing parties are also over-represented relative to their parliamentary representation. Such self-selection biases are difficult to eliminate, as individuals working for certain parties may find participation in a scientific study more interesting or beneficial than others. Moreover, left-wing ideologies tend to convey greater trust in science compared to right-wing ones (Kossowska, Szwed, and Czarnek 2021). Finally, a large majority of respondents (77%) identified themselves as elected officials and we cannot entirely dismiss the possibility that some staffers completed the survey on behalf of MPs. Despite all these limitations – which we try to mitigate in the analysis, this data collection effort provides a foundational sample to help address such an under-studied topic as attitudes toward cyber-security within political parties.

Operationalization of variables

The main dependent variable measures respondents' levels of concern about the security of DIPV procedures. In the survey, each respondent evaluated seven proposals addressing various potential risks associated with online voting within the party. For each proposal, responses were recorded on a scale from 1 (not at all concerned) to 5 (very concerned). As shown in Table 1, respondents generally took relatively neutral positions (mean = 2.5). However, two proposals stood out with slightly higher mean values. Specifically, respondents expressed greater concern about the internal use of personal data collected during the voting process and the possibility of unauthorized individuals participating.

We ran a factor analysis, which revealed that all proposals load onto a single factor (see Appendix 2 Table A). Consequently, for the analysis, we aggregated the responses of the 7 proposals into one scale ranging from 1 to 5 (Cronbach alpha = .90). Higher values indicate greater concern regarding the use of digital voting procedures and, therefore, a more negative overall attitude. The distribution, presented in Figure 1, shows that, apart from neutral standpoints (in the middle of the graph), both negative (right side) and positive (left side) opinions are observed. Notably, positive opinions are more prevalent

Table 1.   Operationalization and descriptive statistics of the dependent variable.

Experts point out that the security of online voting sometimes cannot be fully guaranteed. Could you indicate your level of concern about the following issues?	Min.	Max.	Average	Median
Confidentiality				
a. The possibility that people outside the party may access personal data concerning online voting	1	5	2.5	3
b. The possibility that people within the party may access personal data concerning online voting	1	5	**2.8**	3
Integrity				
c. The possibility that people outside the party may manipulate the results of the vote	1	5	2.5	3
d. The possibility that people within the party may manipulate the results of the vote	1	5	2.4	3
e. The possibility that data inherent to online voting may be manipulated or made public in the future	1	5	2.5	3
Technology				
f. The possibility that some online ballots will not be counted	1	5	2.5	3
g. The possibility that unauthorized people may participate in the vote	1	5	**2.7**	3
Index of cybersecurity concern about DIPV (*N* = 238)	1	5	2.6	2.7

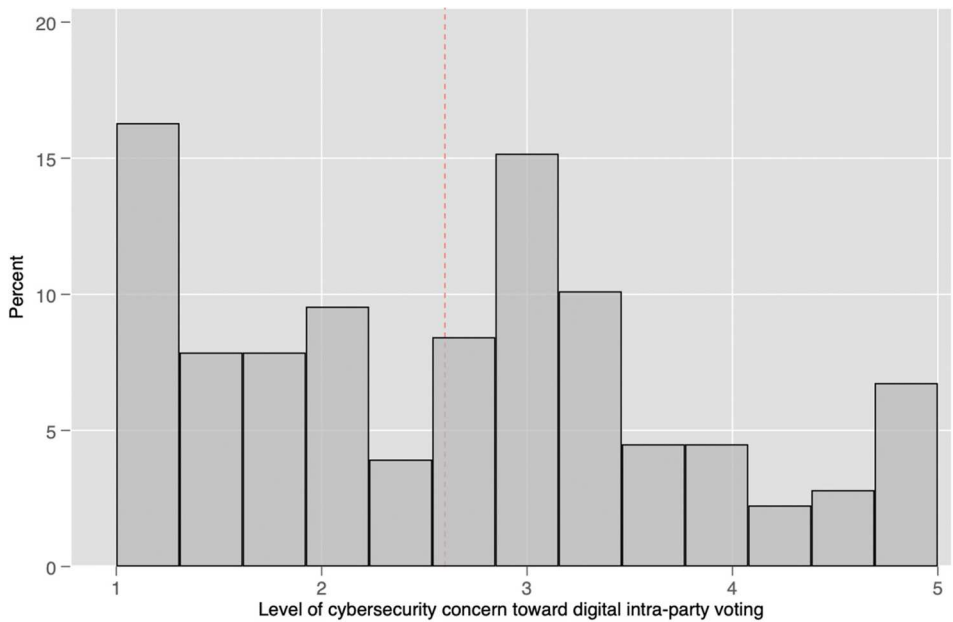Figure 1.   Distribution of the dependent variable: cybersecurity concerns toward digital intra-party voting Caption: bar graph showing the distribution of cybersecurity concern levels regarding digital intra-party voting (DIPV) procedures. A higher value indicates more concerns.

than negative ones, suggesting that respondents were, overall, not highly concerned about using digital technologies for intra-party voting procedures.

Regarding the independent variables, H_1 is tested using respondents' gender, age, and level of formal education. Based on the reviewed literature, the social groups expected to be more concerned about cybersecurity issues include women, older generations, and those with lower levels of formal education. To operationalize this, age was measured across six age groups: 1990–2002 (11%), 1980–1989 (23.3%), 1970–1979 (32.6%), 1960–1969 (24.4%), and before 1959 (8.7%). We then assigned respondents to numerical values ranging from 1, for the youngest generation to 5, for the oldest. The level of formal education is measured using the International Standard Classification of Education (ISCED). Given the relatively high education levels in the sample compared to the general population, we categorized respondents into three groups: those with a master's degree or higher (coded as 3; 20.5% of the sample), those with a bachelor's degree (coded as 2; 56.7%), and those with lower levels of education (coded as 1; 22.8%). To test H_2, we use an independent variable based on respondents' occupations within their party, distinguishing between members of parliament (coded as 1; 77%) and political assistants/staffers (coded as 0; 23%). To assess H_3, we include an independent variable measuring respondents' perceived experience with the digitalization of party activities during the COVID-19 crisis, based on a survey battery of five items (see Appendix 3 for item wording). The factor analysis reveals that they load onto one single dimension (see Appendix 2 Table B). Then, we built an aggregate index (Cronbach's alpha = .75), where higher scores indicate more negative experiences with digital tools during the COVID-19 lockdowns (mean = 2.9).

At the party level, to examine H_4, H_5, and H_6, we introduced three independent variables based on respondents' party affiliation. First, each party was associated with its ideological family using the Party Facts database (Döring and Regel 2019). Regionalist parties were not treated as a distinct family due to their ideological heterogeneity; instead, they were assigned to the closest ideology based on information from Party Facts. To test H_4, which focuses on the radical or moderate nature of party ideology, we classified parties as promoting either radical/extreme ideologies (far left or far right; 37.4%) or moderate ones (social democrats, conservatives, liberals, and greens; 62.6%). Second, to test H_5, party age was measured as a continuous variable based on the foundation year of the party organization listed in Party Facts, with higher values indicating younger parties. Third, to test H_6, we used a continuous variable representing parties' left-right ideology, based on the Chapel Hill Expert Survey Data (Jolly 2022). Specifically, the 'LRGEN' variable measured the party's overall ideological stance in 2019, ranging from 0 (extreme left) to 10 (extreme right).

To conclude, we accounted for the over-representation of certain parties in our sample by adding two control variables. First, based on updated information from the MAPP database (van Haute, Paulis, and Sierens 2018), we included the size of party membership. Given that the median values are relatively similar across the three countries (30,000 members in Spain, 40,000 in Italy, and 35,000 in Belgium), and to minimize the influence of outliers, we grouped parties into four categories. Higher values correspond to parties with larger membership bases. Second, we considered parliamentary size, measured as the percentage of seats obtained in the national parliament in the most recent national election. For respondents affiliated with parties that do not compete at the national level, this variable was set to zero. Finally, we deliberately excluded the opposition or majority status of parties due to the presence of a grand national coalition in Italy during the data collection period.

Modeling

In terms of analyses, we test our hypotheses via pooled linear regression models (OLS), which include country-fixed effects. The complete regression table is available in Appendix 4. Therein, we reported non-standardized coefficients to identify the effect of variables (significant or not) and their direction. We also inform about the standardized coefficients to capture the strength of each of the variables in the model. In addition to the baseline model, we finally also introduce some interaction terms in a second step, allowing us to further disentangle some of our findings. When relevant, we calculated, plotted, and discussed predictive margins for different groups.

Results

Our first expectation, related to the socio-demographic profile, did not pass the empirical test. As suggested by Figure 2, there is no significant relationship between respondents' profiles in terms of gender, age, or educational level and their attitudes towards the digitalization of their party's voting procedures, thus rejecting H_1. The effect of these attributes might benefit from being explored in a larger sample, where smaller effect sizes might eventually be observed. However, this finding may also suggest that socio-demographic factors have relatively little influence on perceived security concerns cybersecurity issues in the realm of party organization because party actors have relatively homogeneous levels of resources and educational attainment, notably in contrast to the general population. Moreover, concerns about digital security may be seen as institutional (rather than individual) issues by respondents, minimizing the role of personal socio-demographic factors. Finally, party actors often undergo socialization processes that emphasize collective decision-making, trust in institutional norms, and adherence to
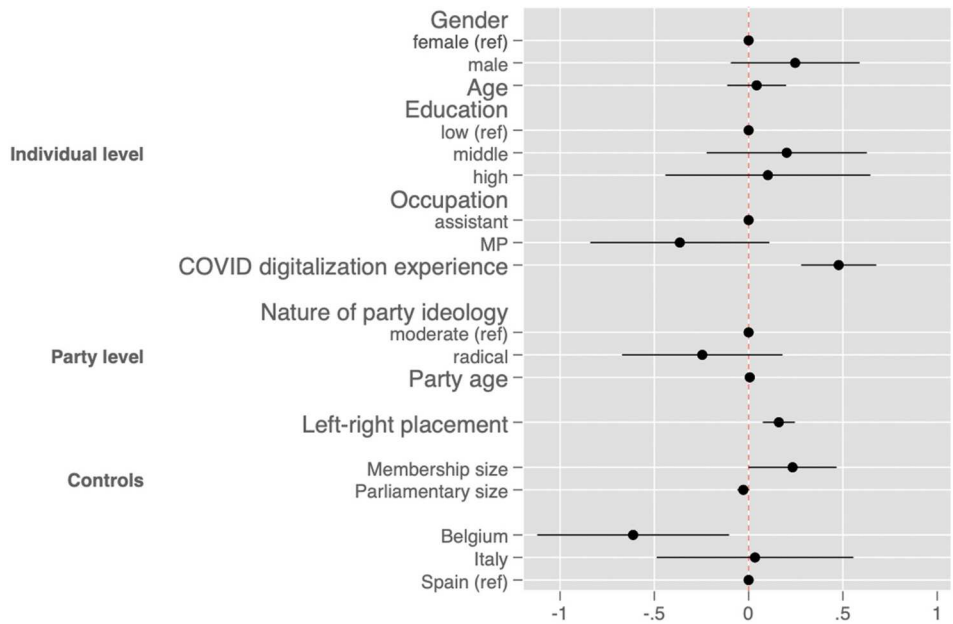

Figure 2.   Coefficient plot of the main model's results. Caption: Coefficient plot presenting the results of the main OLS model.

party procedures. These experiences may diminish the influence of personal socio-demographic attributes, such as gender or age, as party identity and culture become the dominant lenses through which they view and evaluate organizational changes.

Second, our results do not indicate a statistically significant difference in the propensity to express concerns about the security of DIPV procedures between MPs and collaborators. As shown in Figure 1, the coefficient is negative, suggesting that MPs might even be less concerned than collaborators, which contrasts with our initial expectation (H_2). This may point to a knowledge and awareness gap between elected officials and staffers, as the latter are possibly more familiar with digital tools and, consequently, more aware of the underlying security challenges associated with their use in party organizations. Still, as our hypothesis also indirectly suggested that the occupational difference might intersect with a generational gap – the mean value of our age variable indicates that collaborators are, on average, younger (2.2) than MPs (3.1), we decided to investigate further by including an interaction between respondents' occupation and age in the model. Interestingly, the findings, presented under the format of a profile plot in Figure 3, reveal a significant difference between MPs and collaborators regarding security concerns, but only for older generations, particularly those born before the 1980s and the onset of the digital era. In short, older collaborators are more worried than older MPs. For younger generations, occupation does not appear to make a significant difference. Furthermore, age does not substantially affect MPs' security concerns (stable around the scale mid-point for all age groups), whereas there is a more pronounced and significant generational gap among collaborators. Older staffers are much more concerned about the security implications of using digital technologies for intra-party purposes compared to their younger, digital-native counterparts. This could reflect generational differences in risk
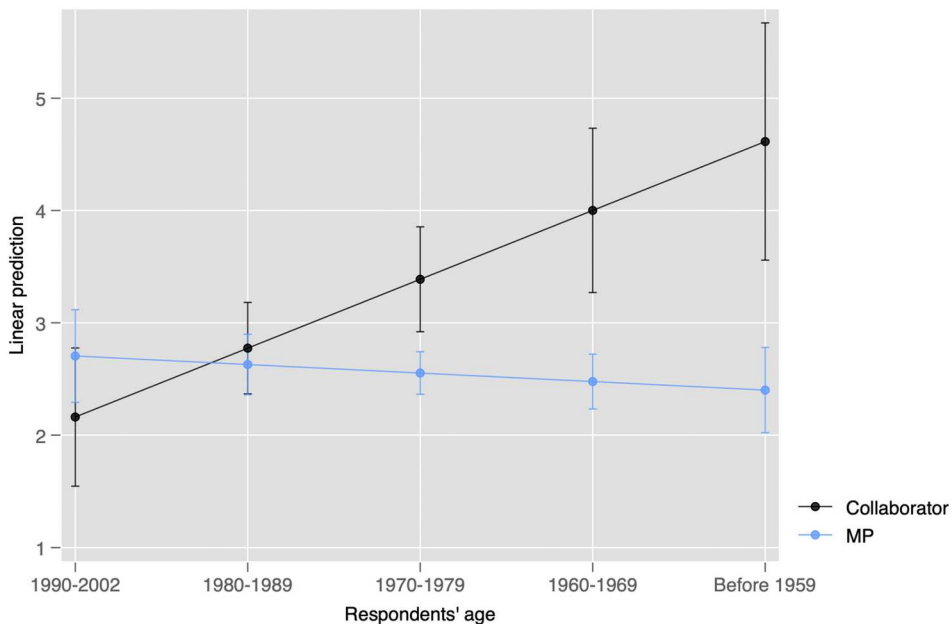

Figure 3.   Predictive margins of respondents' occupation by age. *Caption: Profile plot presenting the predicted marginal means of the level of cyber-security concerns for a combination of respondents' occupation and age.*

perception, technology acceptance, and trust, with older staffers having been socialized in a pre-digital political environment, where paper-based systems and traditional methods were considered more secure. Yet, only further research would allow us to disentangle the mechanisms at play here.

Third, as shown in Figure 2, the most significant and impactful effect observed in the model relates to the experience of the COVID-19 crisis. Specifically, we found a strong correlation between how negatively party actors evaluated the near-total digitalization of their professional activities during the pandemic and their concerns about the security of intra-party voting procedures in its aftermath. This finding provides full support for H_3. More broadly, it confirms that the experience of the COVID-19 crisis may have shaped attitudes toward cybersecurity and may have served as a crystallizing moment for concerns about these issues, even when focusing specifically on the use of digital technologies within political parties. Furthermore, it underscores the importance of individuals' personal experiences with digital technologies in shaping their perceptions of their safety and security. Additionally, it suggests that the digital infrastructure provided by the party plays a critical role, as negative evaluations of this infrastructure are associated with higher security concerns regarding digital voting procedures.

Switching to party-level variables, the results of the main model do not support the hypothesis that respondents from radical or younger parties report more security concerns related to DIPV procedures. However, we do find a significant effect of parties' left-right placement. Although most of the literature has generally contrasted newer and radical parties with more traditional ones, this finding suggests that when it comes to perceived security threats of DIPV, the main dividing line lies along the classical left-right dimension. Actors embedded in party organizations leaning to the right of the political spectrum
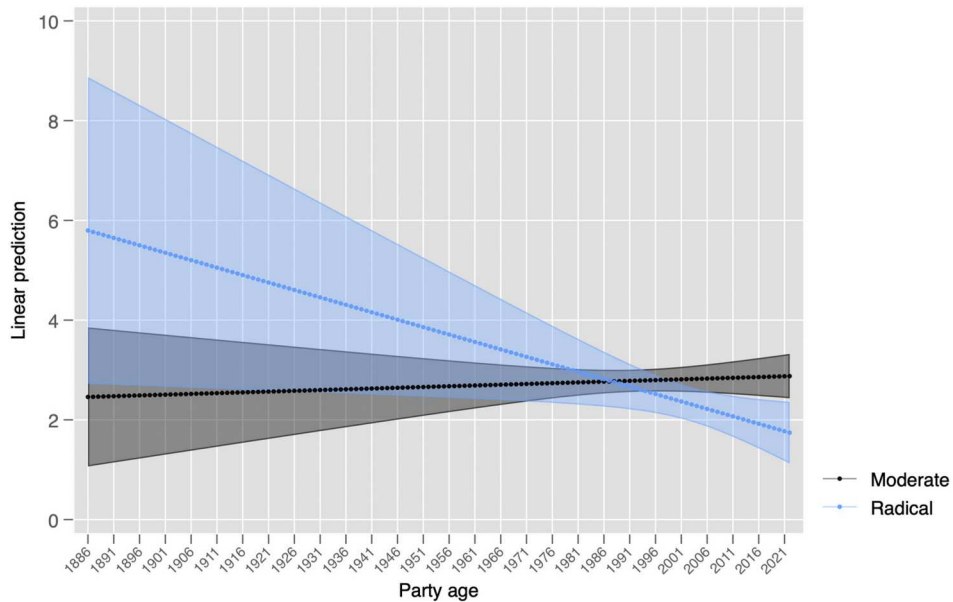

Figure 4.   Predictive margins of party age by nature of party ideology (95 CIs). *Caption: Profile plot presenting the predicted marginal means of the level of cyber-security concerns for a combination of respondents' party ideology and party age.*

tend to be more concerned about the potential security risks associated with online voting. This provides support for H_6 but leads us to reject H_4 and H_5. In this regard, recent studies have reported similar trends in the digitalization of intra-party democracy across both new and established parties (Lupato and Meloni 2023). This bridging situation could imply that perceived risks and threats are now more evenly distributed across these groups of parties. Moreover, the left-right axis is consistently shown to drive divisions in public opinion on cybersecurity (Nam 2019).

Finally, considering the inconclusive results for party age and the nature of party ideology, we sought to investigate further whether their combination could play a role. To this end, we included an interaction term between party age and the ideological orientation of the party for which the respondents worked. We found a modest but significant interaction. As suggested by the marginal plots in Figure 3, we observed a difference between moderate and radical parties, but this only applies to parties founded in the 2000s. Our fourth hypothesis (H_4) should thus be nuanced and restricted to younger party organizations: actors from young, moderate parties expressed more security concerns than those from (young) radical parties – yet the marginal means remain relatively low. This might be explained by the different political cultures and strategic goals that prevail in party organizations, with younger parties being more aware of the challenges of cybersecurity but opting either for a cautious (i.e. young moderates) or 'disruptive' approach (i.e. young radicals). For older parties, the relationship is reversed, with radical parties expressing more cybersecurity concerns than moderate ones, although this difference is not statistically significant. Additionally, this complementary analysis demonstrated that the generational logic we hypothesized (H_5) applies, but only to radical parties. Indeed, Figure 4 shows a party-level generational gap among radical parties, with actors working in radical parties established before the 1990s being substantially more likely to report higher levels of security concerns about DIPV compared to those working in younger radical parties. In contrast, the level of concern remains stable for respondents working for moderate parties, regardless of when these organizations were founded. This could be attributed to the fact that moderate parties' broader electoral appeal, regardless of their age, means they tend to prioritize cybersecurity, as it resonates with public concerns and the policies they enact in this regard, whereas radical parties might perceive proposed such regulation as government overreach, especially in recent years.

Conclusion

This study represents the first attempt to explore a relatively overlooked aspect of the digitalization of political parties: the cybersecurity dilemma. Specifically, this article aimed to investigate how party actors perceive the risks associated with using digital technologies to manage their internal electoral processes. It thus challenges some of the technological determinism present in the field while also highlighting the drawbacks and potential issues posed by the digital turn for party organizations and their staff.

Our study was exploratory in nature, primarily due to the limited existing knowledge on this topic. There are thus several limitations that must be highlighted but that can guide future research. On the one hand, to address our research question, we conducted an original survey in three European countries in 2021, resulting in a relatively small sample of 238 party actors from 48 different parties. This represents the study's major limitation and reflects a broader, recurrent challenge of reaching MPs and staffers through online surveys. In the future, greater efforts could be

made to increase sample sizes, either through new research projects or by systematically including questions about (intra-party) digital procedures and their security in MP surveys. This would enable more substantial and robust quantitative analyses. On the other hand, from a methodological perspective, to better understand how MPs and staffers perceive cybersecurity threats linked to their party's digitalization, qualitative or mixed-method study designs could offer deeper insights, particularly regarding how such threats influence the collective process of integrating digital tools within party organizations. Several recent studies have convincingly adopted this approach, which, while promising, remains underrepresented in party digitalization research (Gherghina and Marian 2024; González-Cacheda and Cancela Outeda 2024; Kins 2024; Oross and Tap 2023).

Still, we believe this study offers several important insights and contributions that can inform future research. First, it highlights that negative experiences with digitalized intra-party activities during the COVID-19 crisis are strongly associated with heightened concerns about the security of online voting within parties. This finding underscores that the compulsory integration of digital tools was challenging for many individuals and that the exceptional circumstances of the pandemic likely contributed to more negative perceptions of digital technologies' security. It adds to the growing body of research on the diverse consequences of the pandemic for individuals and organizations. More broadly, it emphasizes the need to examine how experience with digital tools influences attitudes toward them, even if causality is difficult to establish due to a reciprocal feedback loop. Second, we found that, while MPs across age groups exhibit similar attitudes toward the security of digital intra-party voting procedures, older collaborators express significantly more concerns than their younger counterparts. While contributing to the literature on political personnel, the absence of a generational gap among MPs and its existence among non-elected staffers warrants further investigation to understand the underlying mechanisms. Third, at the party level, the main takeaway is that respondents from right-leaning political parties exhibited more negative attitudes toward digital intra-party voting procedures. Like trends in public opinion, the left-right divide appears to shape perceptions of cybersecurity risks at the party level. This finding may help explain why right-wing parties, particularly conservative ones, are often less inclined to digitalize their internal democratic processes, as highlighted by previous studies (Böhmelt, Ezrow, and Lehrer 2022). Although this deserves more in-depth research, we believe our study points to a crucial factor: individual evaluations of cybersecurity threats can shed light on the collective decisions made by certain political parties regarding digital technologies.

To conclude, our findings contribute to broader theoretical debates. First, regarding parliamentary representation, the digitalization of party processes raises significant cybersecurity concerns that could impact inclusiveness and legitimacy (Maatsch 2024). If parties fail to secure digital voting systems, they risk undermining the representation of members, particularly those reliant on digital platforms for engagement. This, in turn, could weaken their ability to represent the broader electorate. Second, the study advances discussions on intra-party democracy (Barberà et al. 2021). Our findings suggest that cybersecurity concerns can either support or hinder democratic practices within parties. As parties increasingly adopt digital tools, ensuring these technologies promote participation while safeguarding security is critical to fostering legitimate and inclusive decision-making processes. Third, the study addresses the intersection of cybersecurity and politics, a growing concern in digital governance. Cybersecurity risks in political processes, including those within parties, highlight the need for robust digital safeguards to

maintain political legitimacy and trust in democratic institutions (Miller and Vaccari 2020). As digital infrastructures play a larger role in democracy, addressing these risks is essential for safeguarding the integrity of political systems and the trust of citizens.

Notes

1. https://www.mr.be/wp-content/uploads/2024/07/Reglement.pdf
2. It is worth noting that regional parliaments and governments play a prominent role in the three countries, including in terms of response to the COVID-19 crisis.
3. A question regarding the role within the party was included to distinguish between different profiles of respondents.
4. This number is an educated guess based on the expertise and experience of authors on the Belgian political system. There are approximately 430 elected officials at the federal and regional levels, which have from 1 to 3 assistants.

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Data availability and replication

Data (Excel) and replication (Stata) files can be accessed via the following link: https://doi.org/10.7910/DVN/0VVOUT.

Ethical statement

The authors confirm that informed consent was provided by all respondents when accessing the survey online. Participants were guaranteed full anonymity and strict scientific use of their data. Respondents could stop the survey and/or remove their data up to three months after the end of the survey. The research more generally complied with RGPD rules.

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References

An, Q., et al. 2023. "How Education Level Influences Internet Security Knowledge, Behaviour, and Attitude: A Comparison among Undergraduates, Postgraduates and Working Graduates." *International Journal of Information Security* 22 (2): 305–317. https://doi.org/10.1007/s10207-022-00637-z

Armingeon, K., and L. Schädel. 2015. "Social Inequality in Political Participation: The Dark Sides of Individualisation." *West European Politics* 38 (1): 1–27. https://doi.org/10.1080/01402382.2014.929341

Barberà, O., et al. 2021. *Digital Parties: The Challenges of Online Organisation and Participation*. Cham: Springer International Publishing. (Studies in Digital Politics and Governance).

Barrutia, J. M., and C. Echebarria. 2021. "Effect of the COVID-19 Pandemic on Public Managers' Attitudes Toward Digital Transformation." *Technology in Society* 67:101776. https://doi.org/10.1016/j.techsoc.2021.101776

Bloquet, C., I. Borucki, and B. Höhne. 2022. "Digitalization in Candidate Selection. Support and Resistance Within Established Political Parties in Germany." *Frontiers in Political Science* 4.

Böhmelt, T., L. Ezrow, and R. Lehrer. 2022. "Populism and Intra-Party Democracy." *European Journal of Political Research* 61 (4): 1143–1154. https://doi.org/10.1111/1475-6765.12509

Bore, J. 2021. "Privacy and Security Implications of the Coronavirus Pandemic." In *Information Security Technologies for Controlling Pandemics*, edited by H. Jahankhani, S. Kendzierskyj, and B. Akhgar, 213–230. Cham: Springer International Publishing (Advanced Sciences and Technologies for Security Applications).

Bouhon, F., et al. 2020. "L'État belge face à la pandémie de Covid-19: esquisse d'un régime d'exception." *Courrier hebdomadaire du CRISP* 2446 (1): 5–56. https://doi.org/10.3917/cris.2446.0005

Brandsma, G. J., and S. Otjes. 2024. "Gauging the Roles of Parliamentary Staff." *Parliamentary Affairs* 77 (3): 537–557. https://doi.org/10.1093/pa/gsae001

Bruter, M., et al. 2023. *Study on E-Voting Practices in the EU*. Brussels: European Commission, Directorate-General for Justice and Consumers.

Büchi, M., N. Just, and M. Latzer. 2016. "Modeling the Second-Level Digital Divide: A Five-Country Study of Social Differences in Internet use." *New Media & Society* 18 (11): 2703–2722. https://doi.org/10.1177/1461444815604154

Budd, J., et al. 2020. "Digital Technologies in the Public-Health Response to COVID-19." *Nature Medicine* 26 (8): 1183–1192. https://doi.org/10.1038/s41591-020-1011-4

Caiani, M., and L. Parenti. 2013. *Web nero: Organizzazioni di estrema destra e Internet*. Bologna: Il Mulino.

Celeste, E., S. Montgomery, and A. Suriyawongkul. 2022. "Digital Technology and Privacy Attitudes in Times of COVID-19: Formal Legality Versus Legal Reality in Ireland'." *Northern Ireland Legal Quarterly* 73:283. https://doi.org/10.53386/nilq.v73i2.959

Cervera-Marzal, M. 2020. "Podemos: A "Party-Movement" in Government." *Jacobin* [Preprint].

Cipullo, D., and M. L. Moglie. 2021. "To Vote, or not to Vote? Electoral Campaigns and the Spread of COVID-19." *European Journal of Political Economy* 72:102–118.

Correa, P., et al.. 2021. "The Digitalisation of Political Parties in Comparative Perspective." In *Digital Parties: The Challenges of Online Organisation and Participation*, edited by O. Barbera, 287–304. https://doi.org/10.1007/978-3-030-78668-7_15

Dalton, R. J. 2017. *The Participation gap: Social Status and Political Inequality*. Oxford: Oxford University Press.

Dandoy, R., and J. Jeroen. 2018. "Party System Change in Belgium: From Stability to Fragmentation?" In *arty System Change, the European Crisis and the State of Democracy*, edited by Marco Lisi, 24–45. Routledge.

De Blasio, E., and L. Viviani. 2020. "Platform Party Between Digital Activism and Hyper-Leadership: The Reshaping of the Public Sphere." *Media and Communication* 8 (4): 16–27. https://doi.org/10.17645/mac.v8i4.3230

de Nadal, L. 2021. "Populism and Plebiscitarianism 2.0: How Podemos Used Digital Platforms for Organization and Decision-Making." *New Media & Society* 25 (11): 2961–2980.

Deseriis, M., and D. Vittori. 2019. "Platform Politics in Europe | The Impact of Online Participation Platforms on the Internal Democracy of Two Southern European Parties: Podemos and the Five Star Movement." *International Journal of Communication* 13: 19.

Dodel, M., and G. Mesch. 2018. "Inequality in Digital Skills and the Adoption of Online Safety Behaviors." *Information, Communication & Society* 21 (5): 712–728. https://doi.org/10.1080/1369118X.2018.1428652

Dommett, K. 2020. "Roadblocks to Interactive Digital Adoption? Elite Perspectives of Party Practices in the United Kingdom." *Party Politics* 26 (2): 165–175. https://doi.org/10.1177/1354068818761196

Döring, H., and S. Regel. 2019. "Party Facts: A Database of Political Parties Worldwide." *Party Politics* 25 (2): 97–109. https://doi.org/10.1177/1354068818820671

Elstub, S., et al. 2021. "The Resilience of Pandemic Digital Deliberation: An Analysis of Online Synchronous Forums'." *Javnost - The Public* 28 (3): 237–255. https://doi.org/10.1080/13183222.2021.1969616

European Commission. 2020. European Commission: Directorate-General for Migration and Home Affairs, Europeans' attitudes towards cyber security. https://data.europa.eu/doi/10.2837/672023

Faucher, F. 2014. "New Forms of Political Participation. Changing Demands or Changing Opportunities to Participate in Political Parties?" *Comparative European Politics* 13 (4): 405–429. https://doi.org/10.1057/cep.2013.31

Fitzpatrick, J., et al. 2021. "The Five-Pillar Model of Parties' Migration Into the Digital." In *Digital Parties: The Challenges of Online Organisation and Participation*, edited by O. Barberà, 23–42. Cham: Springer International Publishing (Studies in Digital Politics and Governance).

Garnett, H. A., and T. S. James. 2020. "Cyber Elections in the Digital age: Threats and Opportunities of Technology for Electoral Integrity." *Election Law Journal: Rules, Politics, and Policy* 19 (2): 111–126. https://doi.org/10.1089/elj.2020.0633

Gerbaudo, P. 2019. "The Platform Party: The Transformation of Political Organisation in the era of big Data." In *Digital Objects, Digital Subjects: Interdisciplinary Perspectives on Capitalism, Labour and Politics in the Age of Big Data*, edited by David Chandler and Christian Fuchs, 187–198. London: University of Westminster Press.

Gerbaudo, P. 2021. "Are Digital Parties More Democratic Than Traditional Parties? Evaluating Podemos and Movimento 5 Stelle's Online Decision-Making Platforms." *Party Politics* 27 (4): 730–742. https://doi.org/10.1177/1354068819884878

Gherghina, S., and C. Marian. 2024. "Taking Their Game to the Next Level: Why Members Support Party Digitalization." *Swiss Political Science Review.* n/a(n/a)

Giannetti, D., K. Umansky, and I. Sened. 2024. "The Entry of the M5S and the Reshaping of Party Politics in Italy (2008–2018)." *Government and Opposition* 59 (2): 464–481. https://doi.org/10.1017/gov.2022.38

Gillespie, R. 2015. "Between Accommodation and Contestation: The Political Evolution of Basque and Catalan Nationalism." In *Contesting Spain? The Dynamics of Nationalist Movements in Catalonia and the Basque Country*, edited by Richard Gillespie and Caroline Gray, 1–21. London: Routledge.

González-Cacheda, B., and C. Cancela Outeda. 2024. "Digitalisation and Political Parties in Europe." *Party Politics*, 13540688231225639. https://doi.org/10.1177/13540688231225639

Hargittai, E., and A. Shaw. 2015. "Mind the Skills gap: The Role of Internet Know-how and Gender in Differentiated Contributions to Wikipedia'." *Information, Communication & Society* 18 (4): 424–442. https://doi.org/10.1080/1369118X.2014.957711

Huang, D.-L., P.-L. P. Rau, and G. Salvendy. 2010. "Perception of Information Security." *Behaviour & Information Technology* 29 (3): 221–232. https://doi.org/10.1080/01449290701679361

Ignazi, P. 2020. "The Four Knights of Intra-Party Democracy: A Rescue for Party Delegitimation." *Party Politics* 26 (1): 9–20. https://doi.org/10.1177/1354068818754599

Inter-Parliamentary Union. 2016. *Sexism, Harassment and Violence Against Women Parliamentarians*. Geneva: Inter-Parliamentary Union.

Jolly, S., et al. 2022. "Chapel Hill Expert Survey Trend File, 1999–2019." *Electoral Studies* 75:102420. https://doi.org/10.1016/j.electstud.2021.102420

Kenig, O., and S. Pruysers. 2018. "The Challenges of Inclusive Intra-Party Selection Methods." In *Democratizing Candidate Selection*, edited by G. Cordero and X. Coller, 25–48. Cham: Springer International Publishing.

Kins, L. 2024. "Concern, Indifference or Something else? Analysing Attitudes of Party Staff Towards Digital Campaign Tools and Practices in Belgium." *CPSA Annual Conference* 2024, Montreal, Canada.

Kins, L., L. Jacobs, and C. Close. 2024. "Favoring Ingroups, Derogating from Outgroups: How Populist Parties in Belgium Polarize on Social Media." *Acta Politica.* Preprint .

Knight, T., X. Yuan, and D. Bennett Gayle. 2024. "Illuminating Privacy and Security Concerns in Older Adults' Technology Adoption'." *Work, Aging and Retirement* 10 (1): 57–60. https://doi.org/10.1093/workar/waac032

Kossowska, M., P. Szwed, and G. Czarnek. 2021. "Ideology Shapes Trust in Scientists and Attitudes Towards Vaccines During the COVID-19 Pandemic." *Group Processes & Intergroup Relations* 24 (5): 720–737. https://doi.org/10.1177/13684302211001946

Kostelka, F., and J. Rovny. 2019. "It's Not the Left: Ideology and Protest Participation in Old and New Democracies." *Comparative Political Studies* 52 (11): 1677–1712. https://doi.org/10.1177/0010414019830717

Kostka, G. 2023. "Digital Doubters in Different Political and Cultural Contexts: Comparing Citizen Attitudes Across Three Major Digital Technologies." *Data & Policy* 5:e27. https://doi.org/10.1017/dap.2023.25

Lee, C. C., et al. 2019. "Attitudes Toward Computers Across Adulthood from 1994 to 2013." *The Gerontologist* 59 (1): 22–33. https://doi.org/10.1093/geront/gny081

Legein, T. 2023. "Understanding how Bundles of Party Reforms are Shaped: A Snowballing Sequence in the French-Speaking Belgian Liberal Party (MR)." *Party Politics* 30 (5): 894–907.

Lioy, A., M. E. Del Valle, and J. Gottlieb. 2019. "Platform Politics: Party Organisation in the Digital age." *Information Polity* 24 (1): 41–58. https://doi.org/10.3233/IP-180093

Lohan, M., and W. Faulkner. 2004. "Masculinities and Technologies: Some Introductory Remarks." *Men and Masculinities* 6 (4): 319–329. https://doi.org/10.1177/1097184X03260956

Lupato, F. G., and M. Meloni. 2023. "Digital Intra-Party Democracy: An Exploratory Analysis of Podemos and the Labour Party." *Parliamentary Affairs* 76 (1): 22–42. https://doi.org/10.1093/pa/gsab015

Lybeck, R., I. Koiranen, and A. Koivula. 2023. "From Digital Divide to Digital Capital: The Role of Education and Digital Skills in Social Media Participation." *Universal Access in the Information Society* 23 (54): 1657–1669.

Lythreatis, S., S. K. Singh, and A.-N. El-Kassar. 2022. "The Digital Divide: A Review and Future Research Agenda." *Technological Forecasting and Social Change* 175: 1–11. https://doi.org/10.1016/j.techfore.2021.121359.

Maatsch, A. 2024. "Parliamentary Adjustment During a Crisis: Interplay of Digitalization and Domestic Context Factors." *Internet of Things* 27.

Meloni, M., and F. G. Lupato. 2022. "Two Steps Forward, One Step Back: The Evolution of Democratic Digital Innovations in Podemos." *South European Society and Politics* 27 (2): 253–278. https://doi.org/10.1080/13608746.2022.2161973

Mergel, I., N. Edelmann, and N. Haug. 2019. Defining Digital Transformation : Results from Expert Interviews.

Miller, M. L., and C. Vaccari. 2020. "Digital Threats to Democracy: Comparative Lessons and Possible Remedies." *The International Journal of Press/Politics* 25 (3): 333–356. https://doi.org/10.1177/1940161220922323

Morrison, B. A., et al. 2023. "Recognising Diversity in Older Adults' Cybersecurity Needs." In *Proceedings of the 2023 ACM Conference on Information Technology for Social Good. GoodIT '23*, Lisbon, Portugal: ACM, pp. 437–445.

Nam, T. 2019. "Understanding the gap Between Perceived Threats to and Preparedness for Cybersecurity." *Technology in Society* 58:101–122.

Oross, D., and P. Tap. 2023. "Moving Online: Political Parties and the Internal use of Digital Tools in Hungary." *European Societies* 25 (2): 346–370. https://doi.org/10.1080/14616696.2021.1943485

Park, S., et al. 2021. "Going from bad to Worse: From Internet Voting to Blockchain Voting." *Journal of Cybersecurity* 7 (1): 1–15. https://doi.org/10.1093/cybsec/tyaa025.

Paulis, E., et al. 2021. "Les partis politiques belges et l'utilisation des réseaux sociaux." In *Les partis politiques en Belgique*, edited by Pascal Delwit and Emilie van Haute, 67–90. Bruxelles: Éditions de l'Université de Bruxelles.

Paulis, E., and L. Kins. 2022. "All In the Same Boat? The Impact of the COVID19 Crisis on Intra-party Digitalization in Belgium, Italy, and Spain." *ECPR General Conference* 2022, Innsbruck, Austria.

Piquer, J., and A. M. M. Jäger. 2020. "After the Cartel Party: "Extra-Party" and "Intra-Party" Techno-Populism." *Politics and Governance* 8 (4): 533–544. https://doi.org/10.17645/pag.v8i4.3444

Raniolo, F., and V. Tarditi. 2020. "Digital Revolution and Party Innovations: An Analysis of the Spanish Case." *Italian Political Science Review / Rivista Italiana di Scienza Politica* 50 (2): 235–253. https://doi.org/10.1017/ipo.2019.27

Raniolo, F., V. Tarditi, and D. Vittori. 2021. "Political Parties and new ICTs: Between Tradition and Innovation." In *Digital Parties: The Challenges of Online Organisation and Participation*, edited by O. Barbera, 181–204https://doi.org/10.1007/978-3-030-78668-7_10

Rauseo, M., et al. 2023. "Same, but Different? Digital Transformation in Swiss Vocational Schools from the Perspectives of School Management and Teachers." *Technology, Knowledge and Learning* 28 (1): 407–427.

Rodríguez Teruel, J., E. Del Pino, and J. Real-Dato. 2023. "The Limits of Power Concentration and Expert Knowledge in Emergency Management: Spain's Government Response During the First Phase of the Covid-19 Pandemic." *South European Society and Politics* 27: 1–33.

Russo, F., and M. Chironi. 2023. "Going Virtual? Analysing the Digitization of Parliamentary Work During the Covid-19 Pandemic from a Comparative Perspective." *Interdisciplinary Political Studies* 9 (1): 21–41.

Saeed, S., et al. 2023. "Digital Transformation and Cybersecurity Challenges for Businesses Resilience: Issues and Recommendations." *Sensors* 23 (15): 1–20. https://doi.org/10.3390/s23156666.

Sánchez Medero, G. 2024. "Digital Models for the Selection of Party Organs and Election Candidates in Spanish Political Parties: The Impact of Intraparty Democracy." *Frontiers in Political Science* 6: 1–17. https://doi.org/10.3389/fpos.2024.1442331.

Sandri, G., et al. 2024. "Mapping the Digitalisation of European Political Parties." *Information, Communication & Society*, 1–22. https://doi.org/10.1080/1369118X.2024.2343369

Scarrow, S. E., P. D. Webb, and T. Poguntke. 2022. "Intra-party Decision-Making in Contemporary Europe: Improving Representation or Ruling with Empty Shells?" *Irish Political Studies* 37 (2): 196–217. https://doi.org/10.1080/07907184.2022.2046430

Schryen, G. 2004. "Security Aspects of Internet Voting." In *37th Annual Hawaii International Conference on System Sciences,* 2004, Big Island, United States.

Sijstermans, J. 2021. "The Vlaams Belang: A Mass Party of the 21st Century." *Politics and Governance* 9 (4): 275–285. https://doi.org/10.17645/pag.v9i4.4554

Sobieraj, S., and N. C. Krämer. 2020. "Similarities and Differences Between Genders in the Usage of Computer with Different Levels of Technological Complexity." *Computers in Human Behavior* 104:106–145. https://doi.org/10.1016/j.chb.2019.09.021

Spierings, N., and K. Jacobs. 2019. "Political Parties and Social Media Campaigning: A Qualitative Comparative Analysis of Parties' Professional Facebook and Twitter use in the 2010 and 2012 Dutch Elections." *Acta Politica* 54 (1): 145–173. https://doi.org/10.1057/s41269-018-0079-z

Tabata, N., H. Sato, and K. Ninomiya. 2021. "Comparison of Privacy Consciousness Between Younger and Older Adults." *Japanese Psychological Research* 63 (2): 104–110. https://doi.org/10.1111/jpr.12284

Trittin-Ulbrich, H., et al. 2021. "Exploring the Dark and Unexpected Sides of Digitalization: Toward a Critical Agenda." *Organization* 28 (1): 8–25. https://doi.org/10.1177/1350508420968184

Vampa, D. 2020. "Competing Forms of Populism and Territorial Politics: The Cases of Vox and Podemos in Spain." *Journal of Contemporary European Studies* 28 (3): 304–321. https://doi.org/10.1080/14782804.2020.1727866

Vanden Eynde, G. 2023. *Political Finance in the Digital age: A Case Study of Belgium*. Stockholm, Sweden: *International IDEA*.

Van Deursen, A. J. A. M., and J. A. G. M. Van Dijk. 2015. "Internet Skill Levels Increase, but Gaps Widen: A Longitudinal Cross-Sectional Analysis (2010–2013) among the Dutch Population'." *Information, Communication & Society* 18 (7): 782–797. https://doi.org/10.1080/1369118X.2014.994544

van Haute, E., E. Paulis, and V. Sierens. 2018. "Assessing Party Membership Figures: The MAPP Dataset." *European Political Science* 17 (3): 366–377. https://doi.org/10.1057/s41304-016-0098-z

Verba, S., K. L. Schlozman, and H. E. Brady. 1995. *Voice and Equality: Civic Voluntarism in American Politics*. Harvard: Harvard University Press.

Vicente, M. R., and H. Suenaga. 2020. "Exploring Drivers of Online Political Participation in the European Union." In *Applied Economics in the Digital Era*, edited by J. Alleman, P. N. Rappoport, and M. Hamoudia, 175–192. Cham: Springer International Publishing.

Vis, B., and S. Stolwijk. 2021. "Conducting Quantitative Studies with the Participation of Political Elites: Best Practices for Designing the Study and Soliciting the Participation of Political Elites." *Quality & Quantity* 55 (4): 1281–1317. https://doi.org/10.1007/s11135-020-01052-z

Vittori, D. 2024. "More Deliberative-Oriented Than Their Party: The Curious Case of Five Star Movement's Supporters." In *Political Parties and Deliberative Democracy in Europe*, edited by Sergiu Gherghina, 277–291. Routledge.

Vittori, D., and O. Barberà. 2023. "Approaching the Unknown. The 2020 COVID Pandemic, Political Parties and Digital Adaptations: Party élites' Perceptions in Italy and Spain." *Frontiers in Political Science* 5. https://doi.org/10.3389/fpos.2023.1005385

von Nostitz, F., and G. Sandri. 2021. "i-Voting Regulation Within Digital Parties: The Case of Podemos and Five Stars Movement'." *Digital Parties: The Challenges of Online Organisation and Participation*, 85–107. https://doi.org/10.1007/978-3-030-78668-7_5

Zucchini, F., and A. Pedrazzani. 2021. "Italy: Continuous Change and Continuity in Change." In *Coalition Governance in Western Europe*, edited by T. Bergman, H. Back, and J. Hellström, 396–447https://doi.org/10.1093/oso/9780198868484.003.0012

Appendices

Appendix 1. List of parties represented in the sample.

Party	Country	Party family	N
Agora	Belgium	Green	1
Azione	Italy	Liberal	1
Altri da sinistra	Italy	Regionalist	6
Altri destra	Italy	Regionalist	6
Bloque Nacionalista Galego	Spain	Regionalist	2
Candidatura d'Unitat Popular	Spain	Regionalist	1
Catalunya en Comú	Spain	Regionalist	6
Centre démocrate humaniste (CDH)	Belgium	Conservative	2
Christen Democratisch en Vlaams (CD&V)	Belgium	Conservative	5
Chunta Aragonesista	Spain	Regionalist	1
Ciudadanos	Spain	Liberal	11
Coalición Canaria	Spain	Regionalist	2
Compromís	Spain	Regionalist	10
Christlich-Soziale Partei (CSP)	Belgium	Conservative	1
Démocrate Fédéraliste Indépendant (DéFI)	Belgium	Liberal	2
Ecolo	Belgium	Green	16
Esquerra Republicana de Catalunya	Spain	Regionalist	1
Euskal Herria Bildu	Spain	Regionalist	6
Forza Italia	Spain	Conservative	2
Fratelli d'Italia	Italy	Radical right	1
Groen	Belgium	Green	3
Italia Viva	Italy	Liberal	2
Izquierda Unida	Italy	Radical left	19
Lega	Italy	Radical right	8
Liberi e Uguali	Italy	Social democrat	1
Más País	Spain	Social democrat	1
Més per Mallorca	Spain	Regionalist	1
Més per Menorca	Spain	Regionalist	2
Mouvement réformateur (MR)	Belgium	Liberal	5
Nieuw-Vlaamse Alliantie (N-VA)	Belgium	Conservative	3
Open Vlaamse Liberalen en Democraten (Open Vld)	Belgium	Liberal	6
Parti du Travail de Belgium (PTB)	Belgium	Radical left	1
Parti Socialiste (PS)	Belgium	Social democrat	12
Partido Aragonés	Spain	Regionalist	1
Partido Nacionalista Vasco	Spain	Regionalist	1
Partido Popular	Spain	Conservative	3
Partido Regionalista Cántabro	Spain	Regionalist	1
Partido Socialista Obrero Español	Spain	Social democrat	7
Partit dels Socialistes de Catalunya	Spain	Social democrat	6
Partit Demòcrata Europeu Català	Spain	Regionalist	1
Partito Democratico	Italy	Social democrat	4
Podemos	Spain	Radical left	13

Continued.

Party	Country	Party family	N
Potere al Popolo	Italy	Radical left	14
Rifondazione Comunista	Italy	Radical left	19
Unión del Pueblo Navarro	Spain	Regionalist	3
Vlaams Belang (VB)	Belgium	Radical right	2
Vooruit	Belgium	Social democrat	11
VOX	Spain	Radical right	5
Total			238

Appendix 2. Factor analyses

Table A. Dependent variable: cybersecurity concerns

	Factor loadings				Uniqueness
	1	2	3	4	
a. The possibility that people outside the party may access personal data concerning online voting	**.80**	-.14	-.20	.02	.28
b. The possibility that people within the party may access personal data concerning online voting	**.70**	.13	.01	.10	.46
c. The possibility that people outside the party may manipulate the results of the vote	**.81**	.11	-.17	-.07	.28
d. The possibility that people within the party may manipulate the results of the vote	**.78**	.21	.11	-.02	.32
e. The possibility that data inherent to online voting may be manipulated or made public in the future	**.75**	.07	.06	-.01	.41
f. The possibility that some online ballots will not be counted	**.74**	-.16	.13	-.05	.40
g. The possibility that unauthorized people may participate in the vote	**.78**	-.21	.07	0.02	.32

chi2(21) = 686.23
Prob > chi2 = 0.0000
N = 238

Table B. Independent variable: experience with digitalization during the COVID

	Factor loadings		Uniqueness
	1	2	
The party's technical infrastructure was not adequate and required an extra effort on the part of the participants.	**.70**	.01	.49

(Continued)

Continued.

	Factor loadings		
	1	2	Uniqueness
Some participants were not sufficiently trained in new technologies	**.70**	-.09	.49
Some participants lacked the necessary technical capacity.	**.71**	-.05	.48
Some participants were suspicious of these new technologies. which limited the exchange of opinions.	**.62**	.06	.60
Some participants struggled to balance their online presence with their family life.	**.42**	.11	.80
chi2(10) = 217.24			
Prob > chi2 = 0.0000			
N = 238			

Appendix 3. *Operationalization and descriptive statistics of independent variables*

	%	Min.	Max.	Mean
Gender (H1)		0	1	0.6
Q: Are you?				
Female – (0)	39.0			
Male – (1)	61.0			
Age (H1)		1	5	4.0
Q: What age group do you belong to?				
Before 1959 – (1)	8.7			
1960–1969 – (2)	24.4			
1970–1979 – (3)	32.6			
1980–1989 – (4)	23.3			
1990–2002 – (5)	11.0			
Educational level (H1)		1	3	2.0
Q: What is the highest level of degree you have obtained?				
Lower level (OECD categories: not in school or primary school not completed, primary school, lower secondary school, upper secondary education, post-secondary non-tertiary education, short-cycle tertiary education – e.g. DEUG, BTS, DUT) – (1)	22.8			
Intermediate level (OECD categories: university bachelor's degree or equivalent) – (2)	56.7			
Higher level (OECD categories: university degree or equivalent, doctorate or equivalent) – (3)	20.5			
Occupation within the party (H2)		0	1	0.7
Political assistant/staffer – (0)	23.0			
Member of Parliament – (1)	77.0			
Experience with the COVID-19 crisis (H3)		1	5	2.9
Q: In online meetings, problems sometimes arise. Could you indicate how important the following issues have been to your party during the recent COVID-19 crisis? Please rate your answer on a scale of 1–5, where 1 indicates not at all important and 5 indicates very important.				

Continued.

	%	Min.	Max.	Mean
The party's technical infrastructure was not adequate and required an extra effort on the part of the participants.		1	5	2.6
Some participants were not sufficiently trained in new technologies		1	5	3.0
Some participants lacked the necessary technical capacity.		1	5	3.1
Some participants were suspicious of these new technologies. which limited the exchange of opinions.		1	5	2.4
Some participants struggled to balance their online presence with their family life.		1	5	2.9
Nature of party ideology (H4)		0	1	0.3
Party with moderate ideology (Greens, Social Democrats, Conservatives, Liberals) – (0)	62.6			
Party with radical ideology (radical left and extreme right) – (1)	37.4			
Party age (H5)		1895	2019	1193.8
Left-right placement (H6)		1	9.7	3.9
Party membership size		1	4	2.4
< 15,000 members	17.2			
15,000–29,999 members	38.0			
30,000–70,000 members	34.5			
> 70,000 members	10.3			
Parliamentary representation (% of seats)		0	34.3	6.4

Appendix 4. Results of the regression analysis

DV = Level of concerns regarding the security of DIPV (1-5)	Main model		Main model w/ interaction	
	Non standardized coefficients	Beta coefficients	Non standardized coefficients	Beta coefficients
INDIVIDUAL-LEVEL				
Gender (ref = women)				
Men	0.25 (−0.09–0.59)	0.10	0.29 (−0.04–0.63)	0.12
Age	0.04 (−0.11–0.22)	0.04	0.56** (0.21–0.91)	0.55
Education (ref = low)				
Middle	0.20 (−0.22–0.63)	0.08	0.24 (−0.18–0.66)	0.10
High	0.07 (−0.44–0.65)	0.03	0.16 (−0.38–0.69)	0.06
Occupation (ref = Collaborator)				
Members of Parliament	−0.36 (−0.84–0.11)	−0.13	1.14* (0.10–2.18)	0.42
COVID 19 experience	0.48*** (0.22–0.61)	0.36	0.39*** (0.20–0.58)	0.36
Age X Occupation			−0.62** (−1.00–−0.24)	− 0.89
PARTY-LEVEL				
Nature of party ideology (ref = moderate)				
Radical	−0.25	−0.10	−0.44**	−0.18

Continued.

DV = Level of concerns regarding the security of DIPV (1-5)	Main model		Main model w/ interaction	
	Non standardized coefficients	Beta coefficients	Non standardized coefficients	Beta coefficients
	(−0.67–0.18)		(−1.12–0.24)	
Party age	0.01	0.01	0.00	0.03
	(−0.00–0.18)		(−0.01–0.01)	
Left-right placement	0.16***	0.34	0.14**	0.30
	(0.08–0.25)		(0.06–0.23)	
Ideology X Age			0.02*	0.08
			(−0.00–0.05)	
CONTROL				
Party membership size	0.23*	0.19	0.29*	0.24
	(−0.00–0.47)		(0.06 - 0.52)	
Parliamentary size	−0.03	−0.18	−0.03	− 0.18
	(−0.06–0.00)		(−0.06 - 0.00)	
Country (ref = Spain)				
Belgium	−0.61*	−0.25	−0.55*	-0.23
	(−1.12--0.10)		(−1.05--0.05)	
Italy	0.03	0.01	−0.03	−0.01
	(−0.77–1.43)		(−0.55–0.49)	
Constant	0.33		−0.83	
	(−0.77–1.43)		(−2.16–0.49)	
Observations (N = 159)				167
R-squared	0.27		0.32	0.29

OLS regression.
Confidence intervals (95%) in parentheses.
p-value = *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.